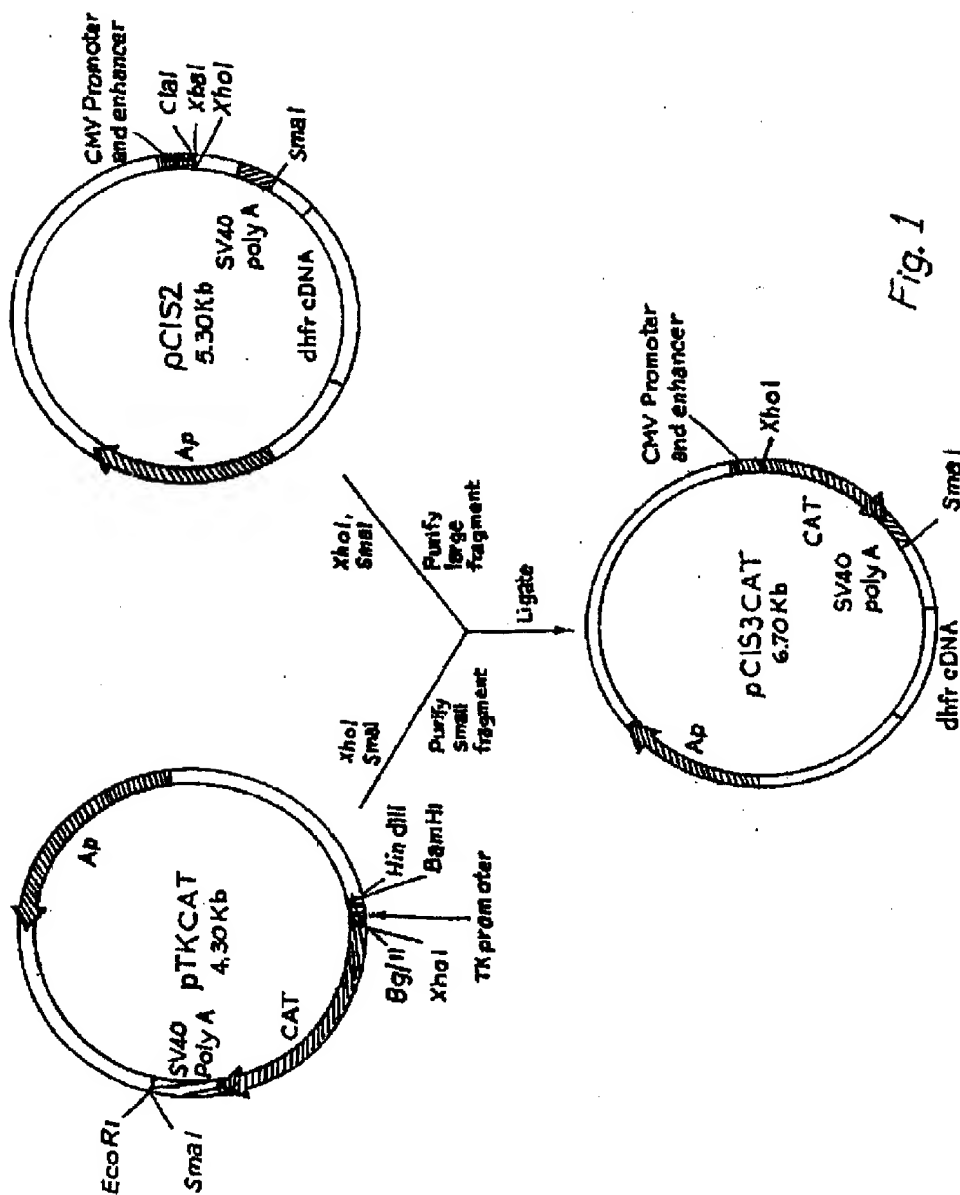


U.S. Patent

Nov. 4, 1997

Sheet 1 of 7

5,683,866



U.S. Patent

Nov. 4, 1997

Sheet 2 of 7

5,683,866

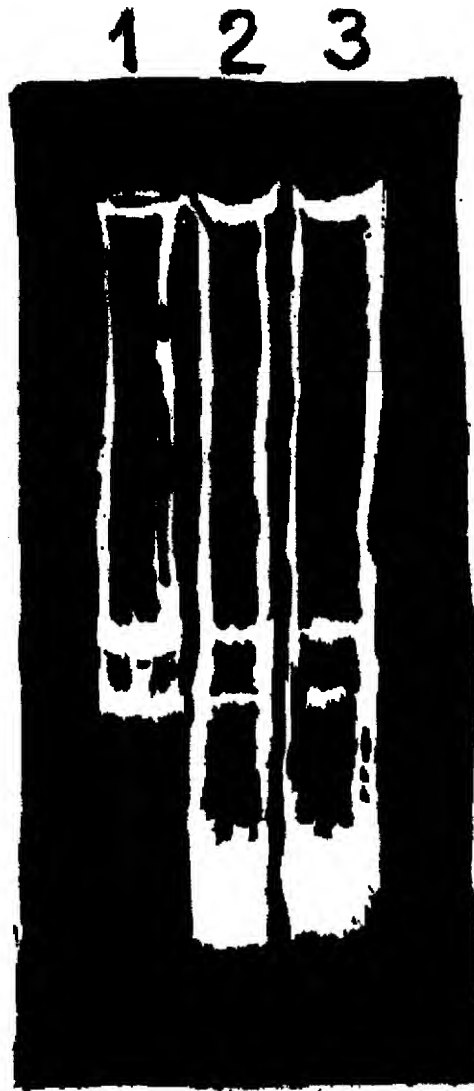


Fig. 2

U.S. Patent

Nov. 4, 1997

Sheet 3 of 7

5,683,866

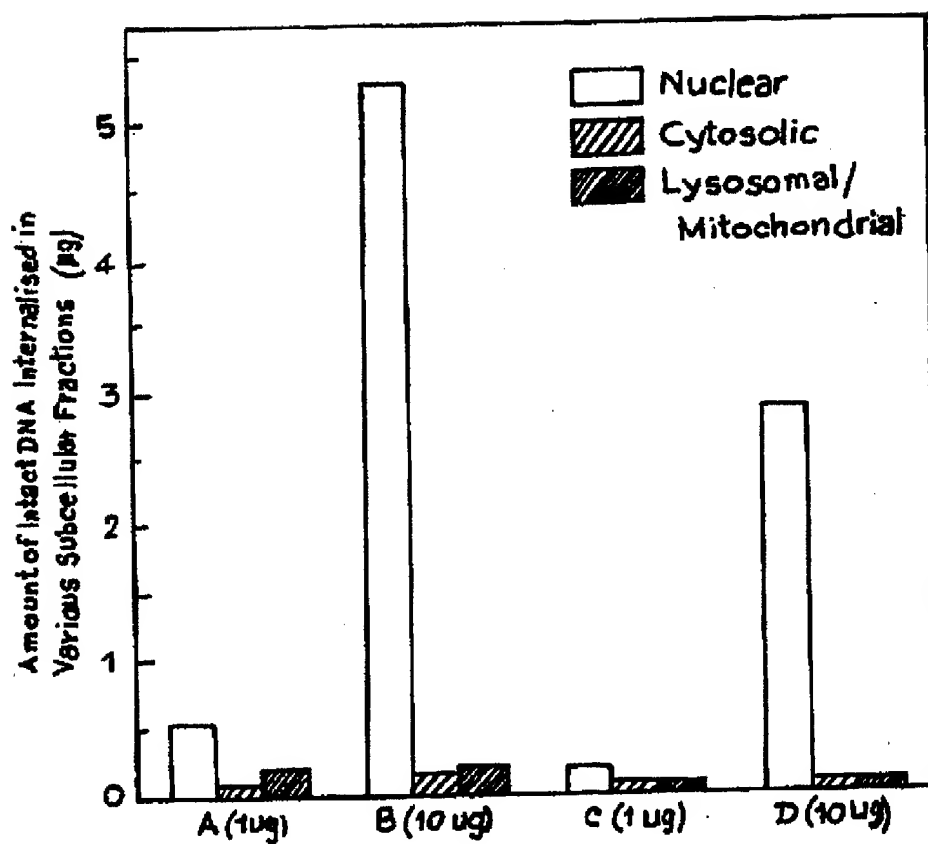


Fig. 3a

U.S. Patent

Nov. 4, 1997

Sheet 4 of 7

5,683,866

1	2	3	4	5	6	7	8	9	10	11	12	13
11 12 13			11 12 13									11 12 13

Fig. 3b

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 1 of 29

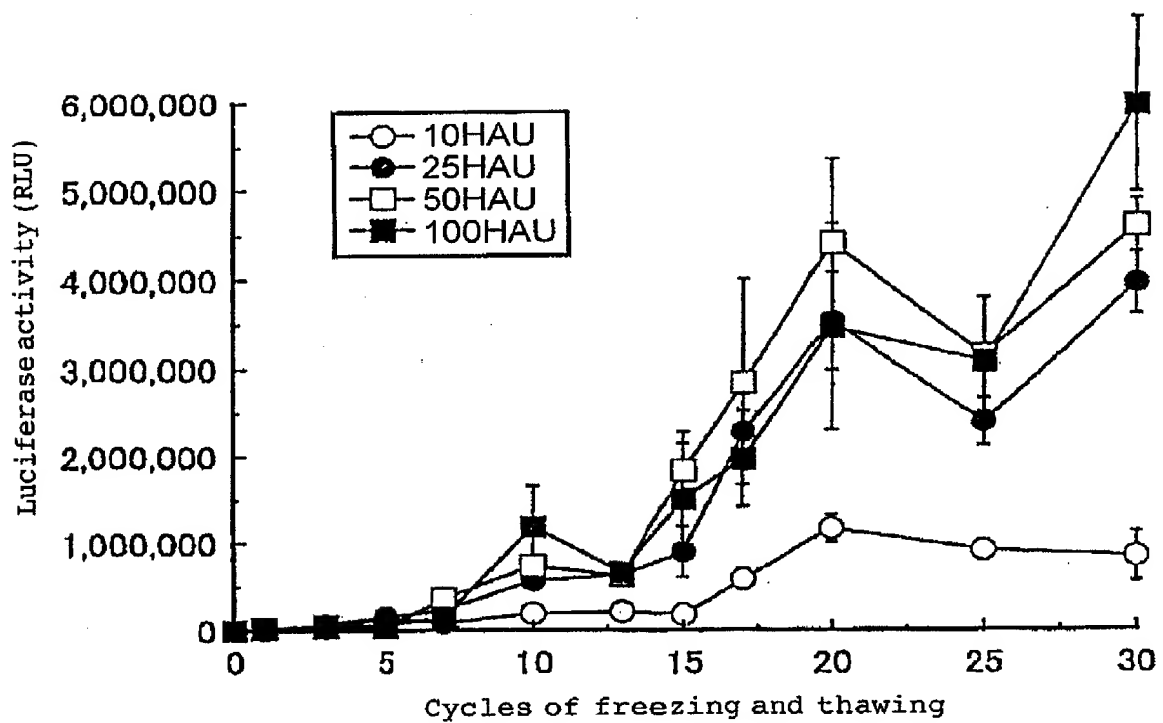


Fig. 1

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 2 of 29

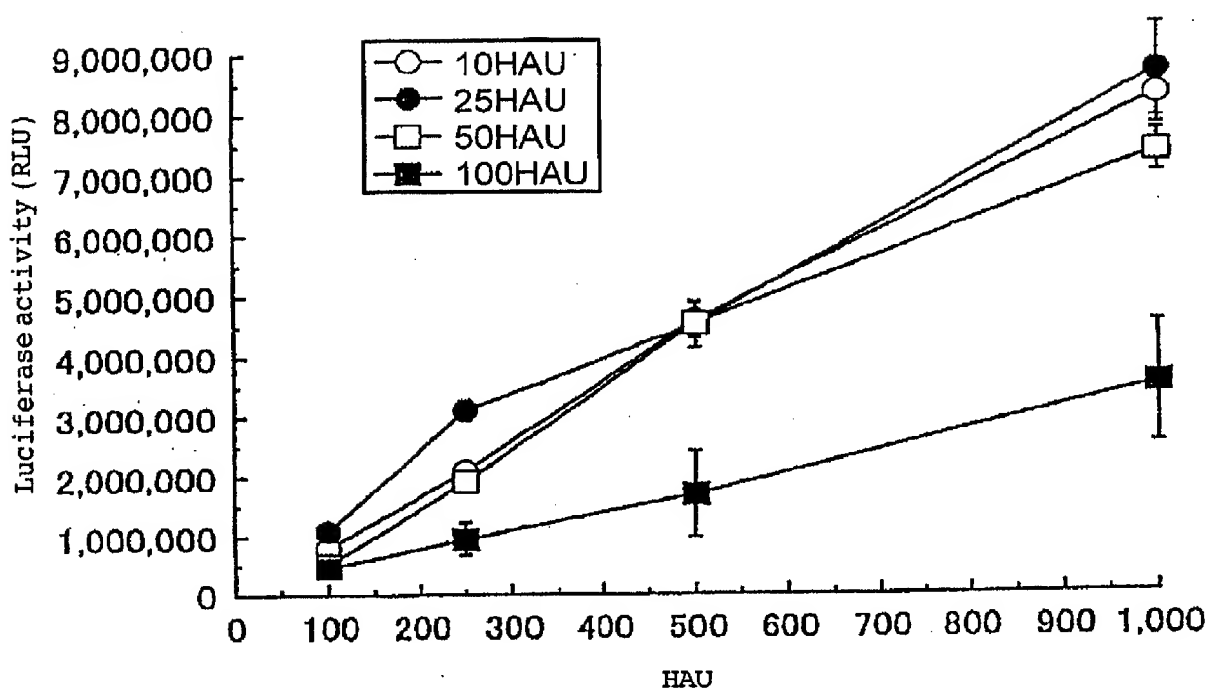
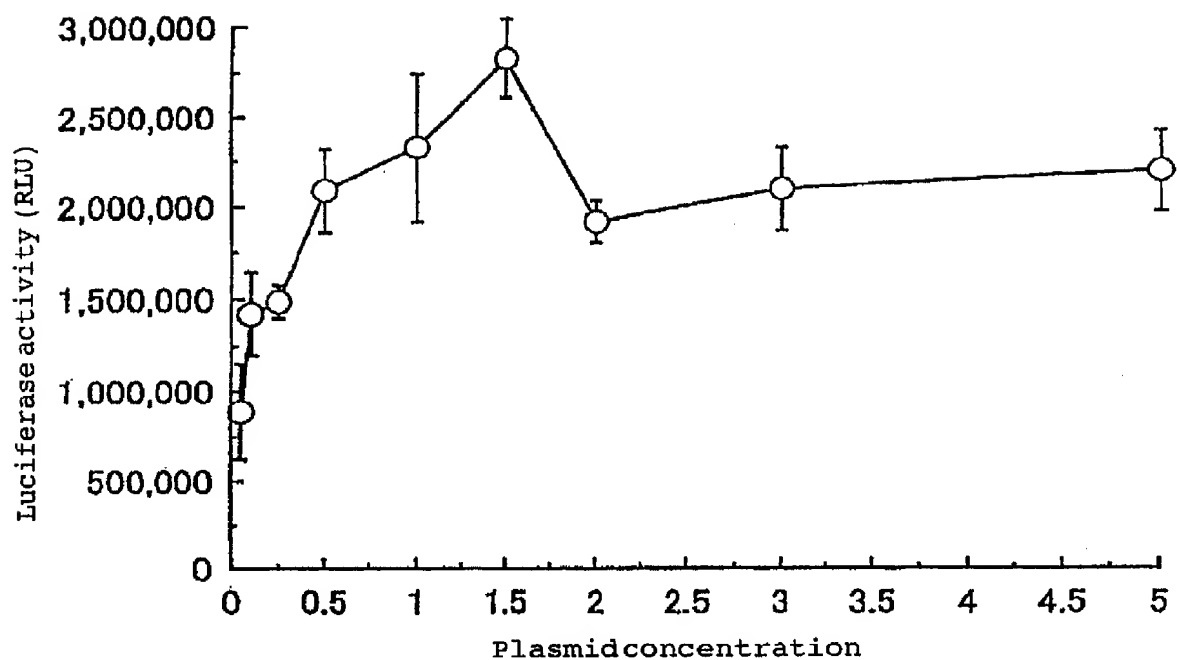


Fig. 2

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 3 of 29

**Fig. 3**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 4 of 29

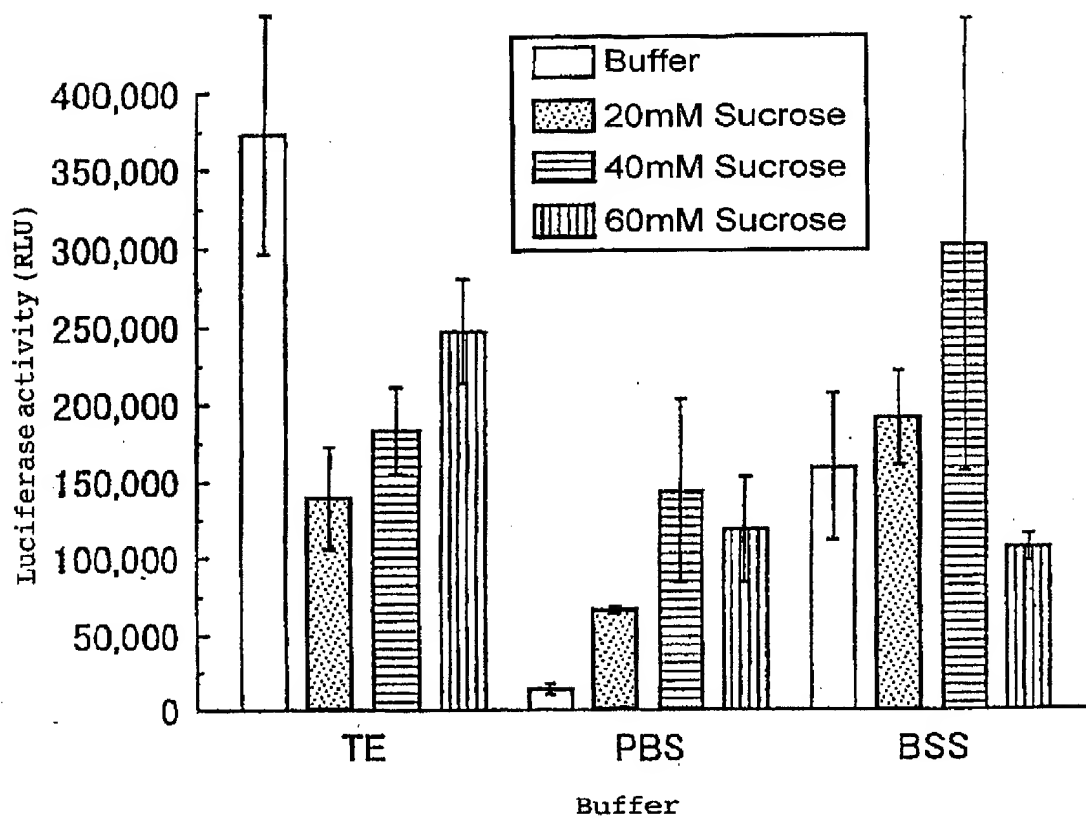


Fig. 4

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 5 of 29

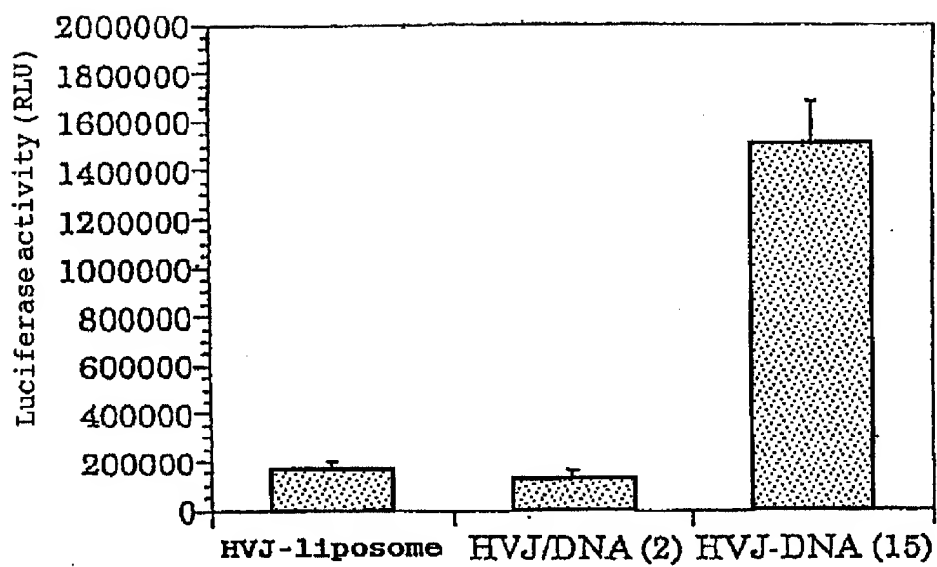


Fig. 5

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 6 of 29

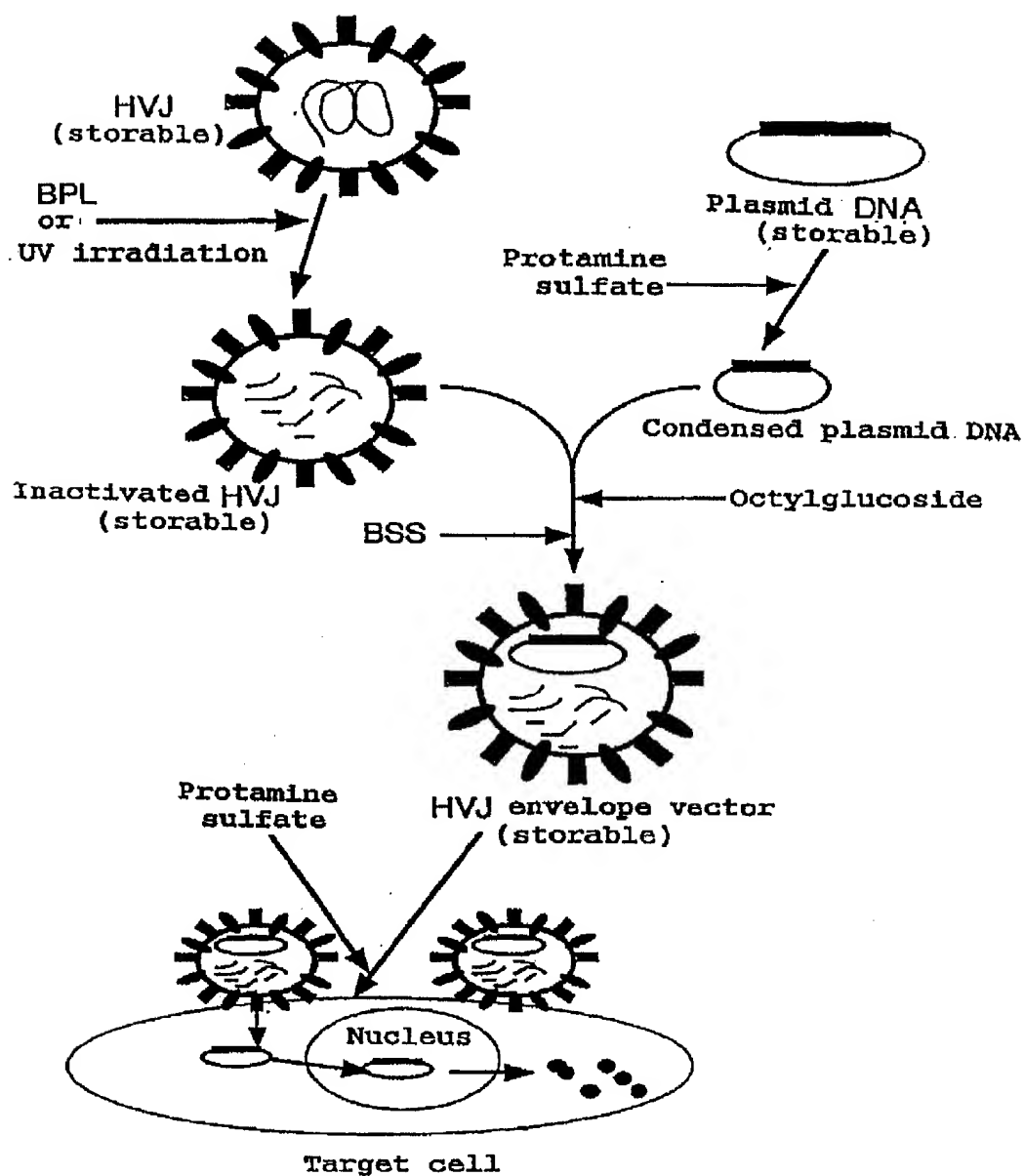
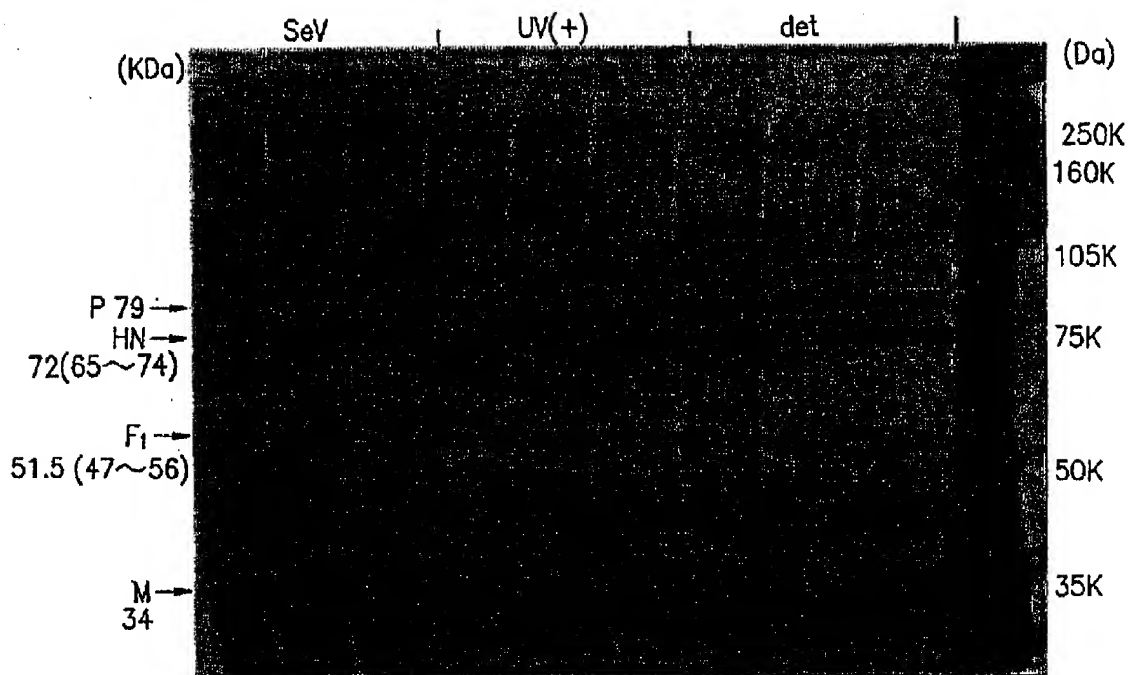
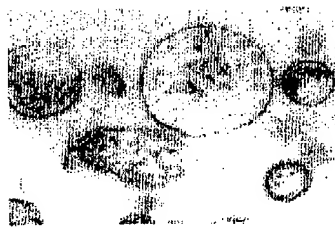


Fig. 6

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 7 of 29

**Fig. 7**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 8 of 29



— 100nm

Fig. 8A

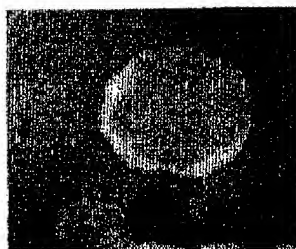


Fig. 8B



Fig. 8C

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 9 of 29

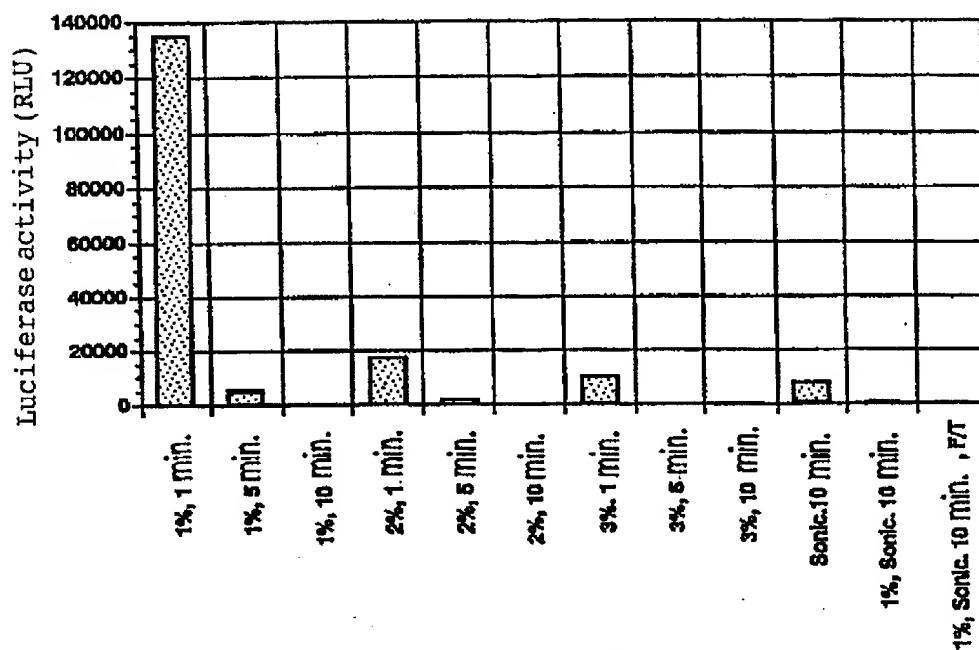


Fig. 9A

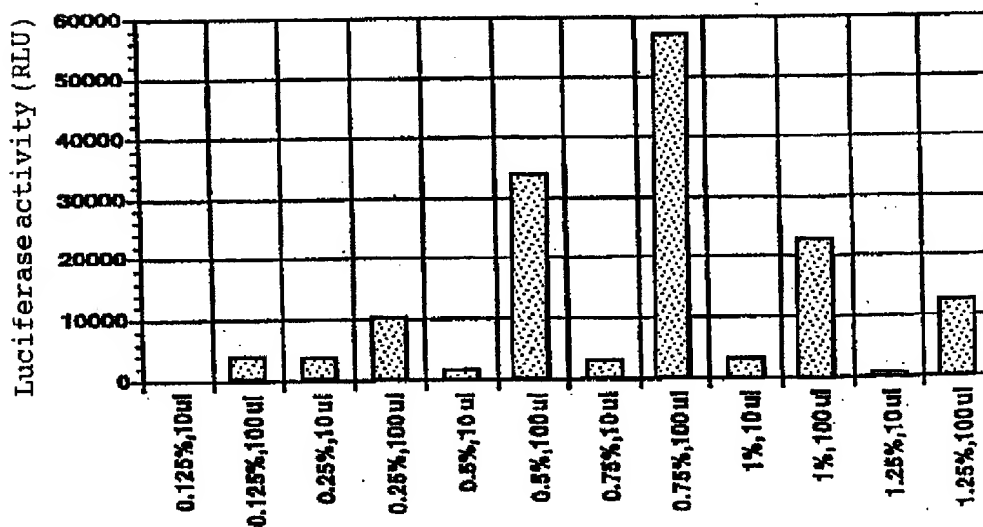
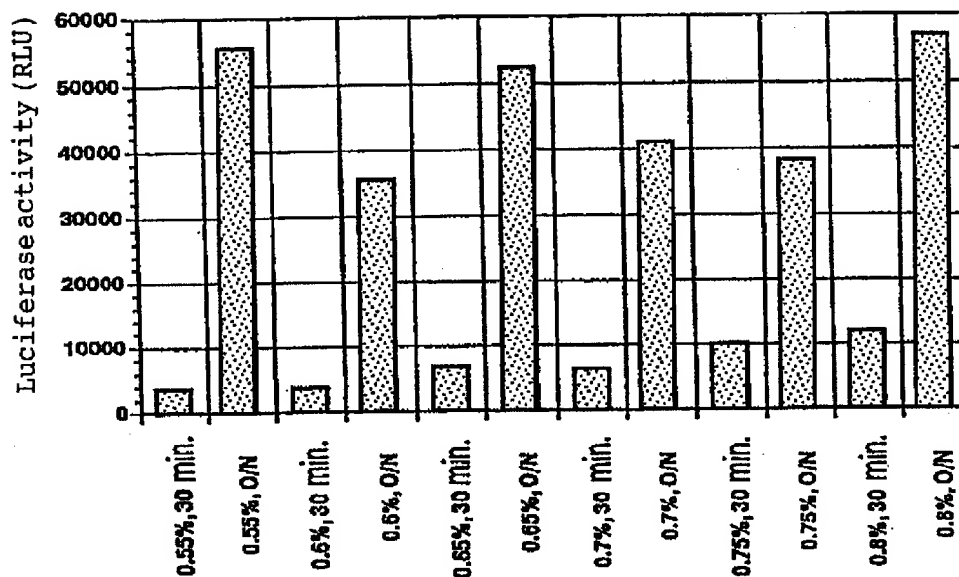


Fig. 9B

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 10 of 29

**Fig. 9C**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 11 of 29

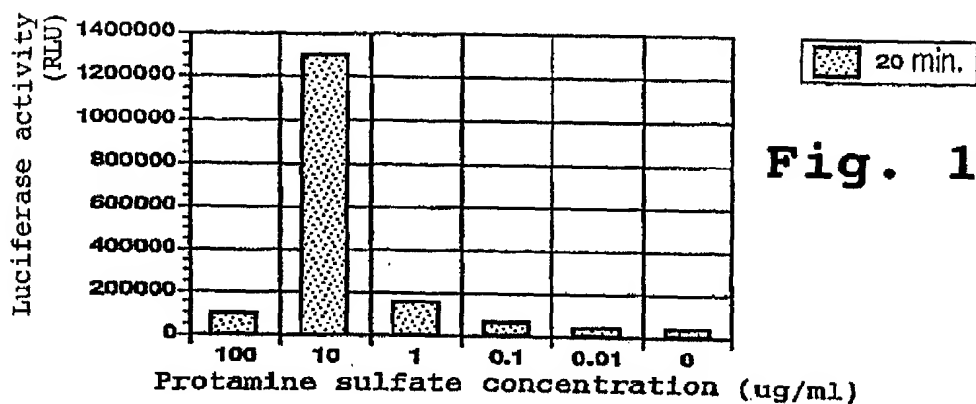


Fig. 10A-1

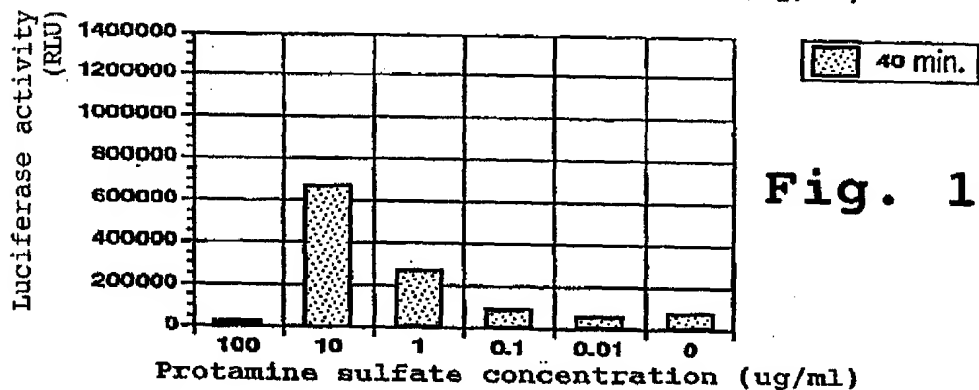


Fig. 10A-2

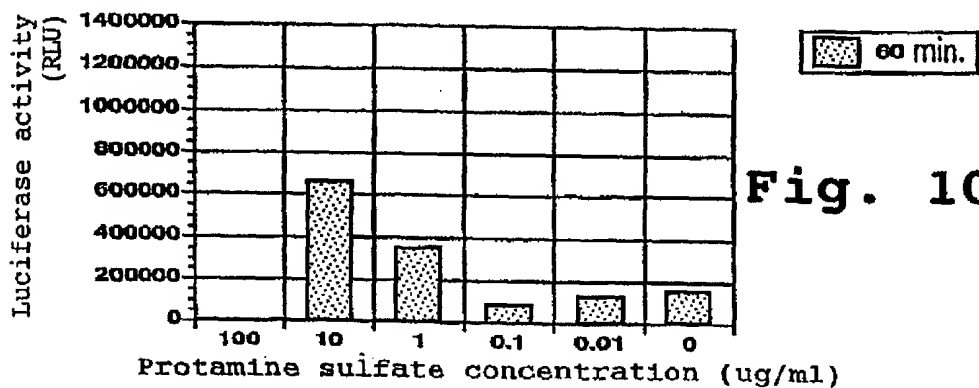


Fig. 10A-3

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 12 of 29

Effects of protamine sulfate on gene
transfer by HVJ envelope vector

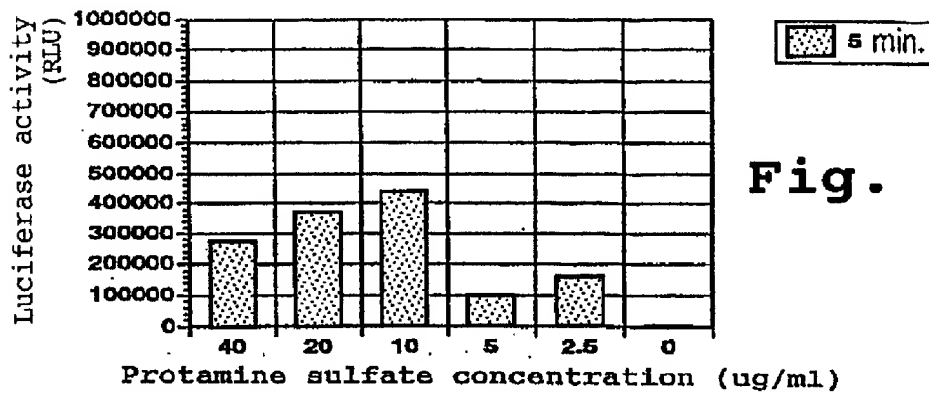


Fig. 10B-1

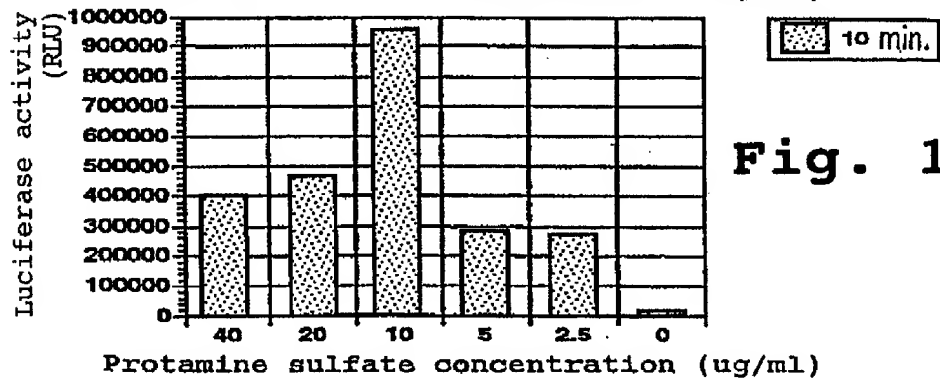


Fig. 10B-2

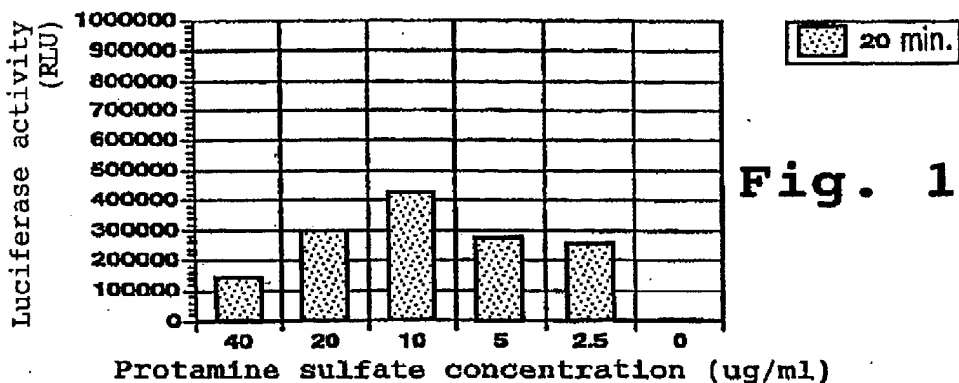
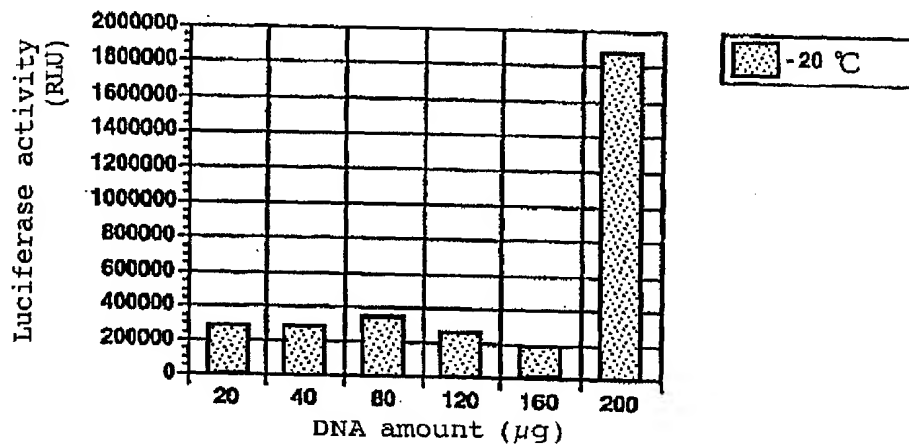
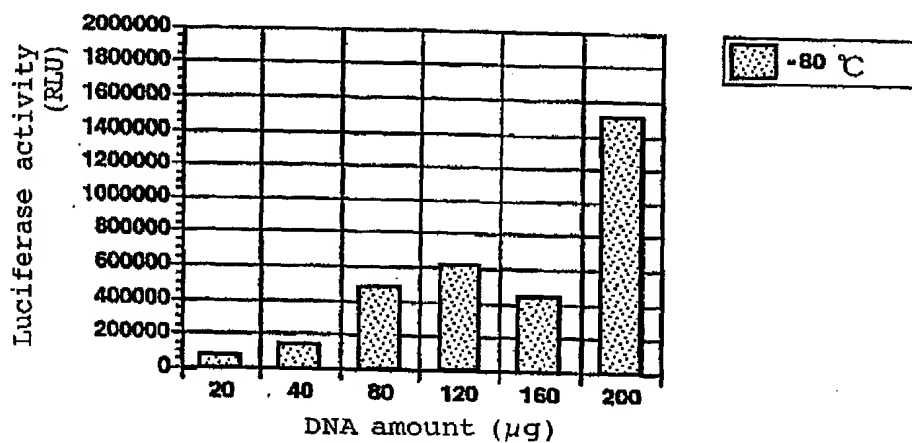


Fig. 10B-3

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 13 of 29

**Fig. 11A-1****Fig. 11A-2**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 14 of 29

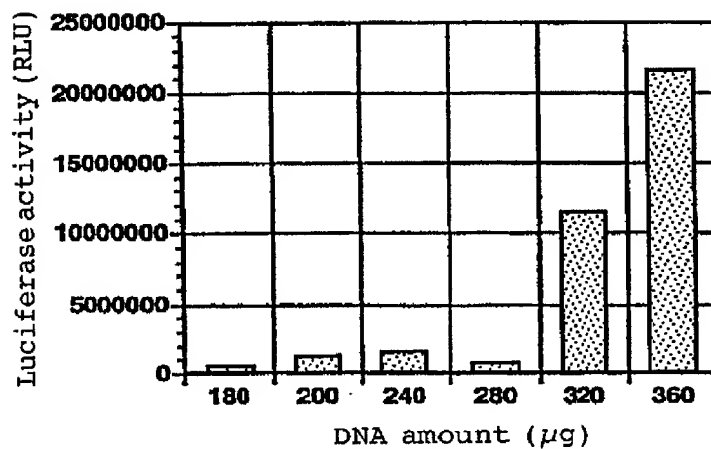


Fig. 11B

Title: VIRUS ENVELOPE VECTOR FOR GENE

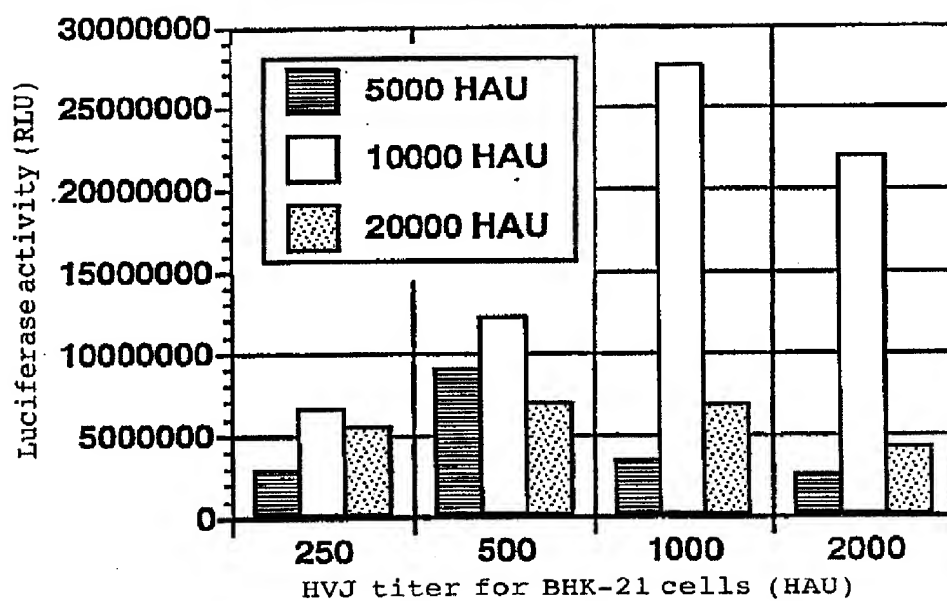
TRANSFER

Inventors: Yasufumi Kaneda

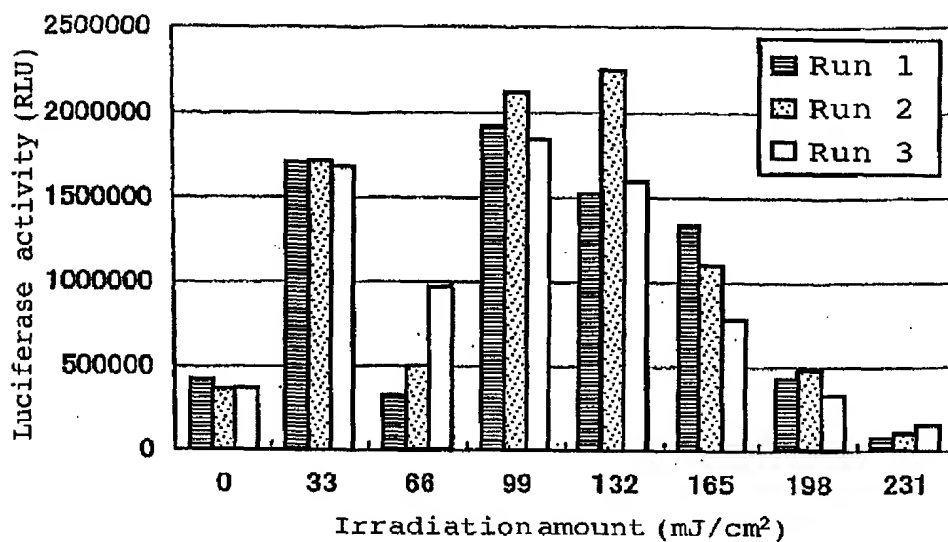
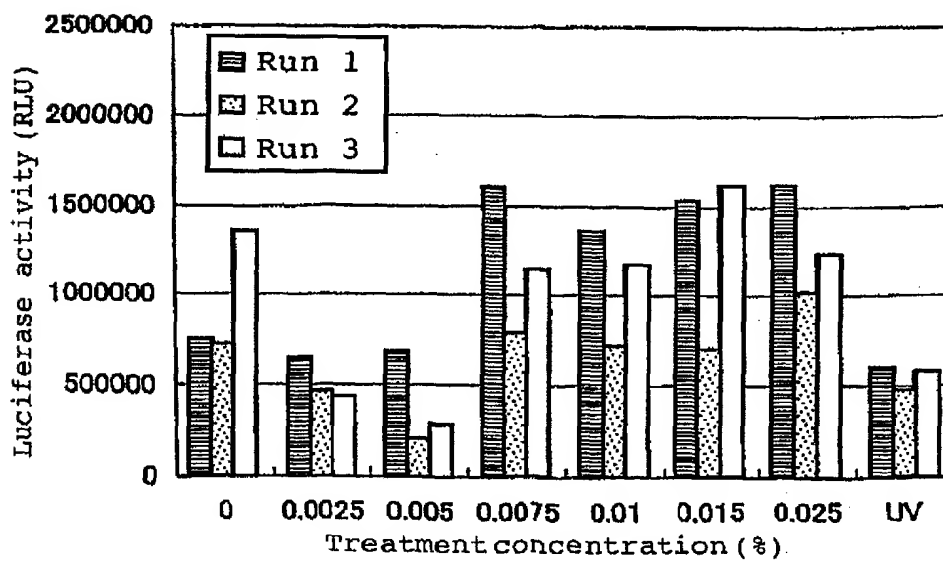
Attorney Docket No. 59150-8010

Customer No. 22918

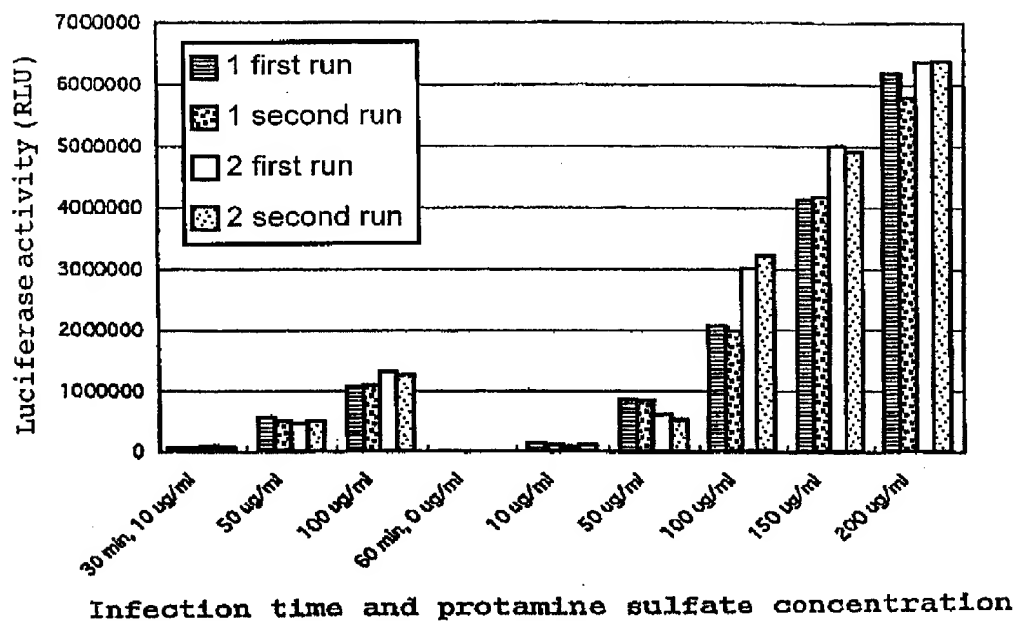
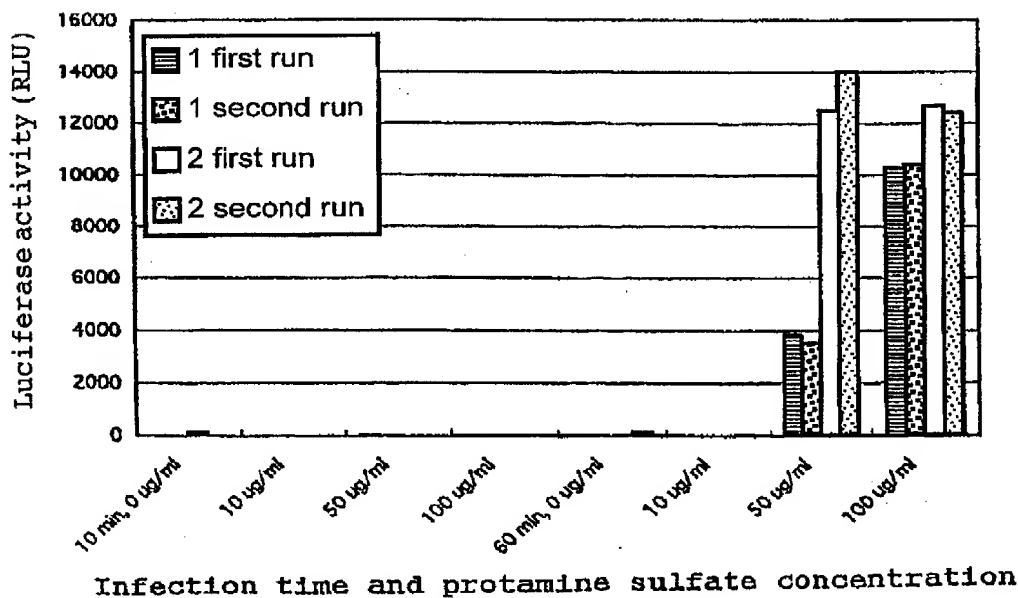
Sheet 15 of 29

**Fig. 12**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 16 of 29

**Fig. 13A****Fig. 13B**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 17 of 29

**Fig. 14****Fig. 15**

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 18 of 29

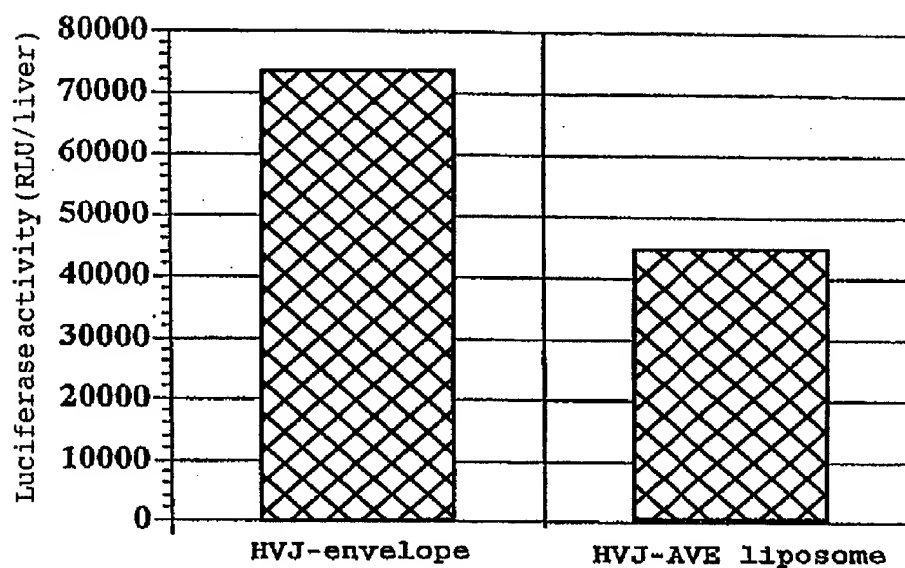


Fig. 16A

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 19 of 29

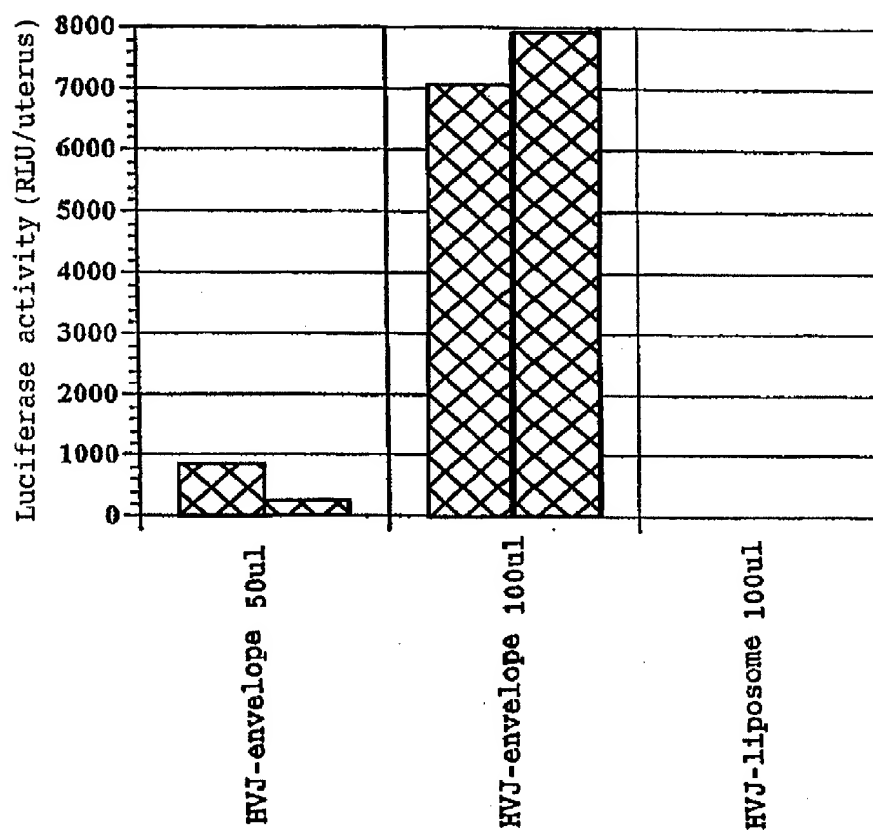


Fig. 16B

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 20 of 29



Fig. 16C

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 21 of 29

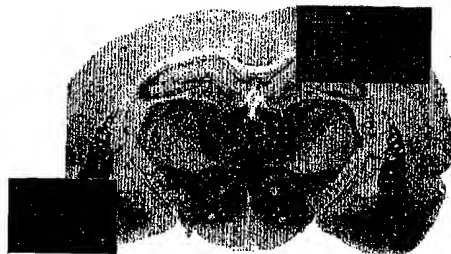


Fig. 16D-1

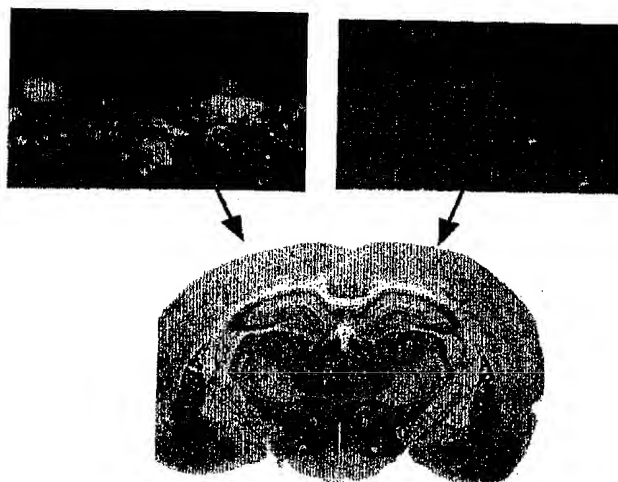


Fig. 16D-2

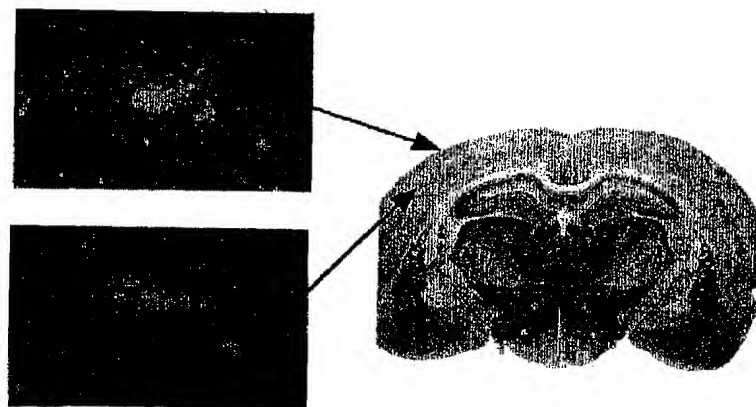


Fig. 16D-3

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-3010
Customer No. 22918 Sheet 22 of 29

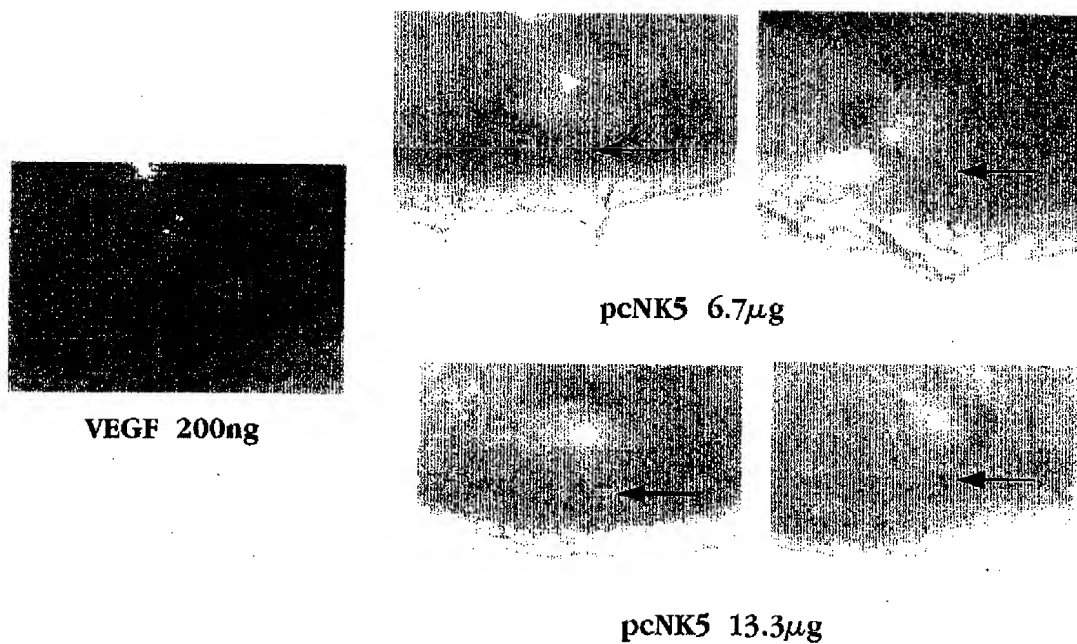


Fig. 16E

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 23 of 29

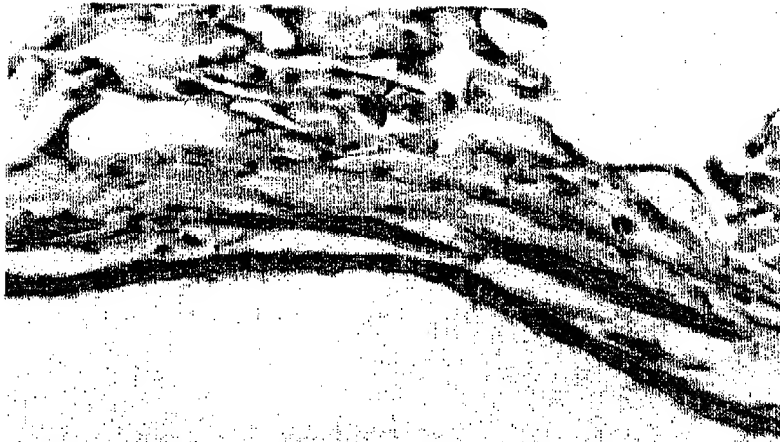
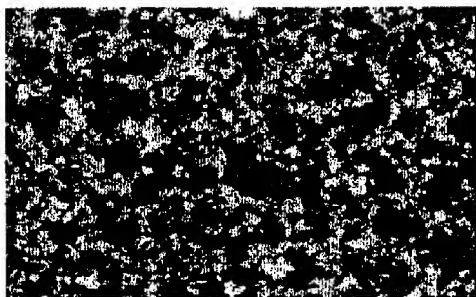


Fig. 16F

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 24 of 29

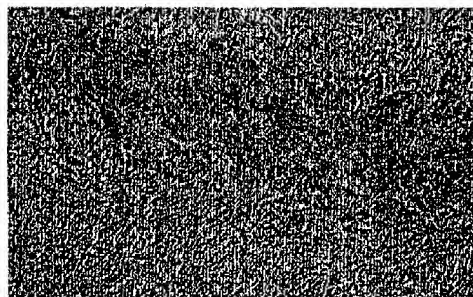
Fluorescenceimage



60 min

Fig. 17A-1

Phase-contrastimage



60 min

Fig. 17A-2

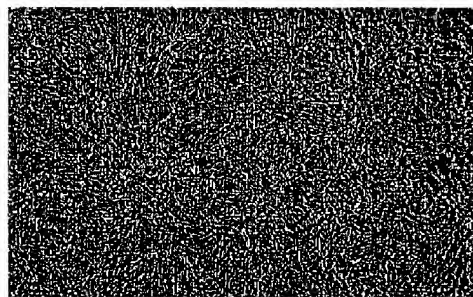
Fluorescenceimage



10 min

Fig. 17B-1

Phase-contrastimage



10 min

Fig. 17B-2

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 25 of 29

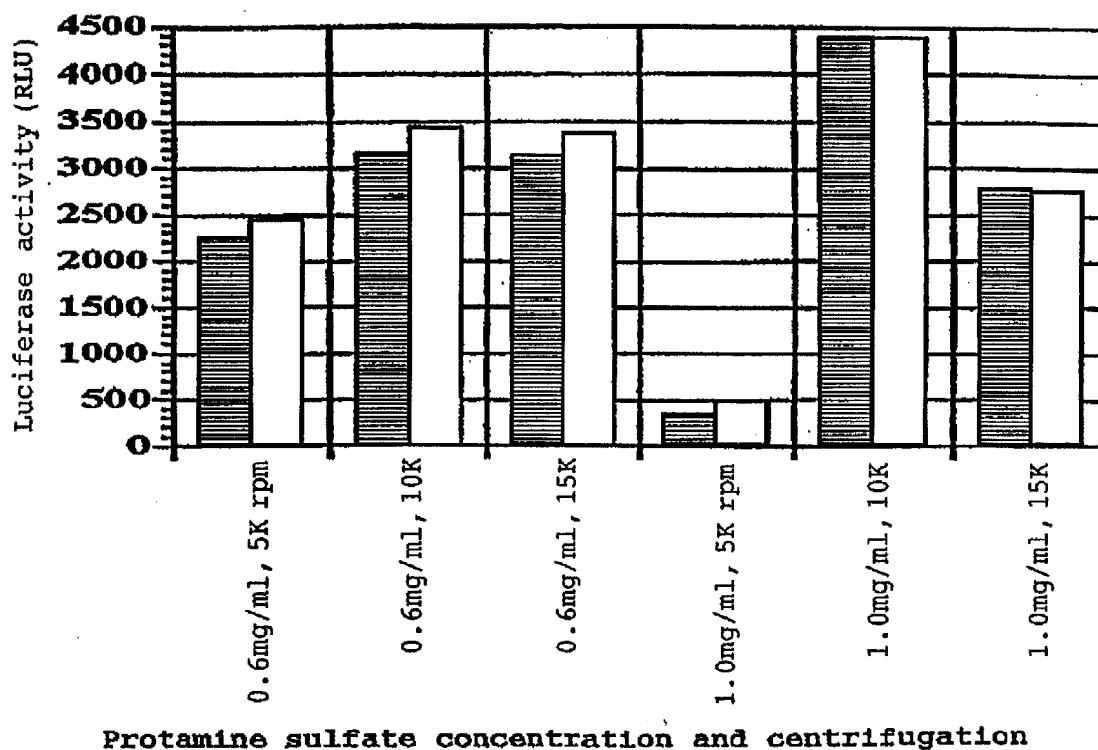


Fig. 18A

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 26 of 29

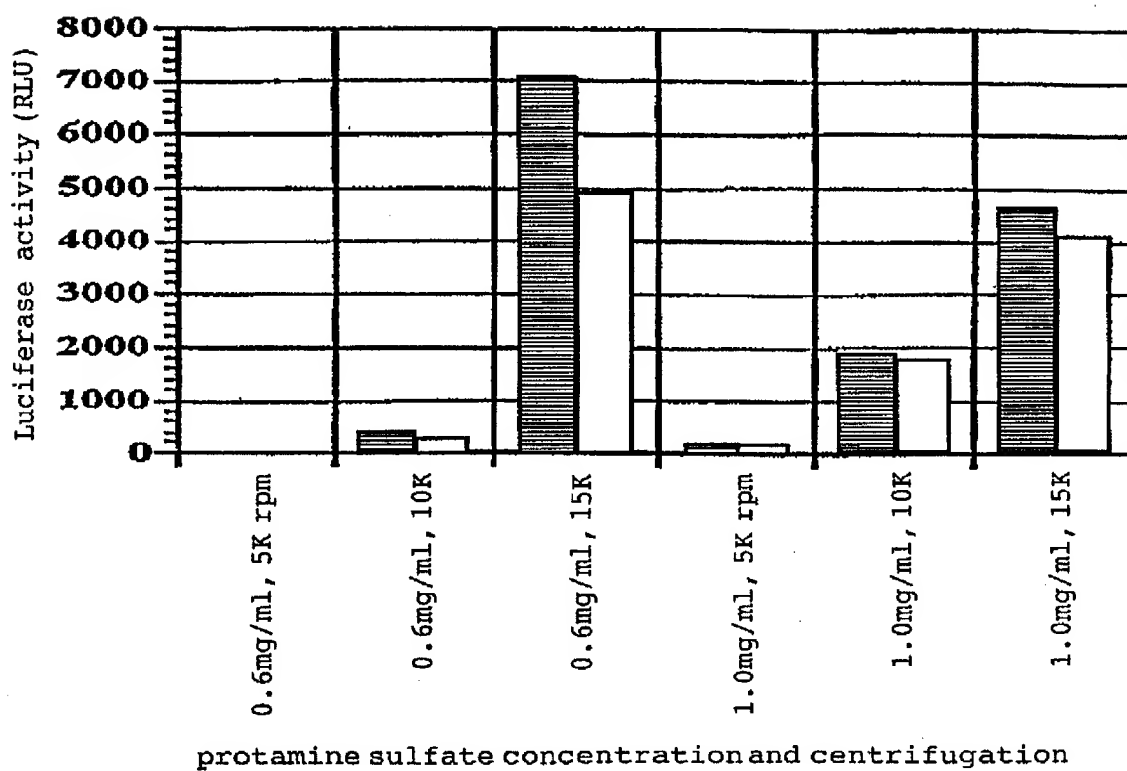


Fig. 18B

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 27 of 29

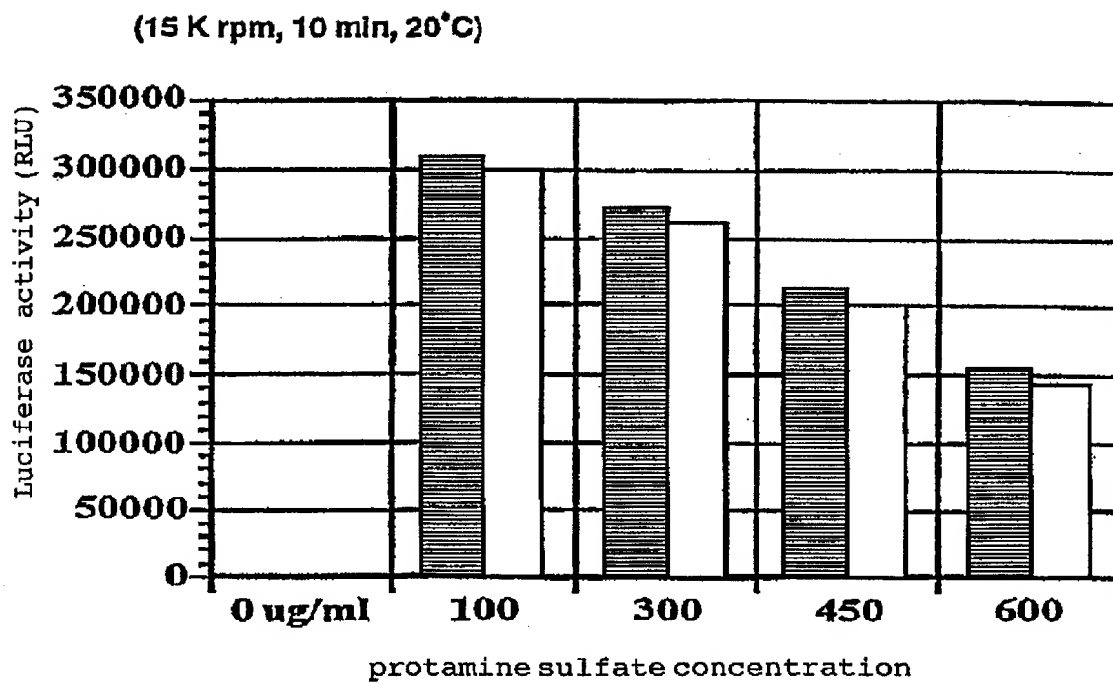


Fig. 18C

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 28 of 29

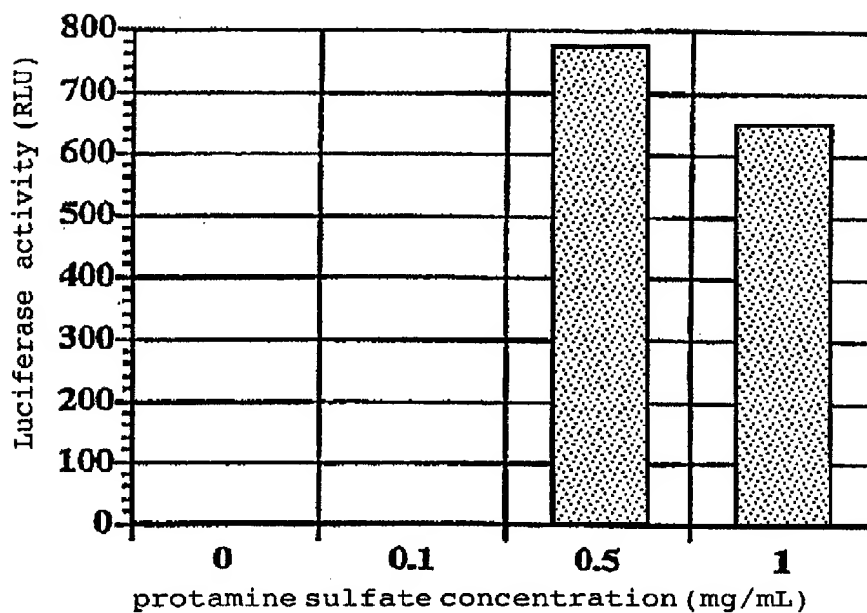
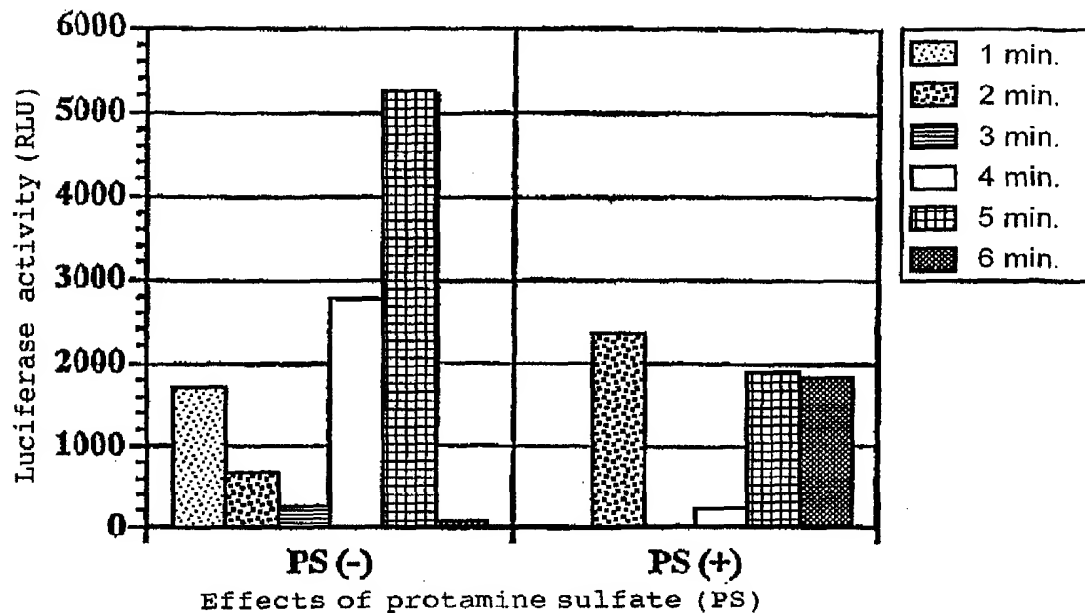
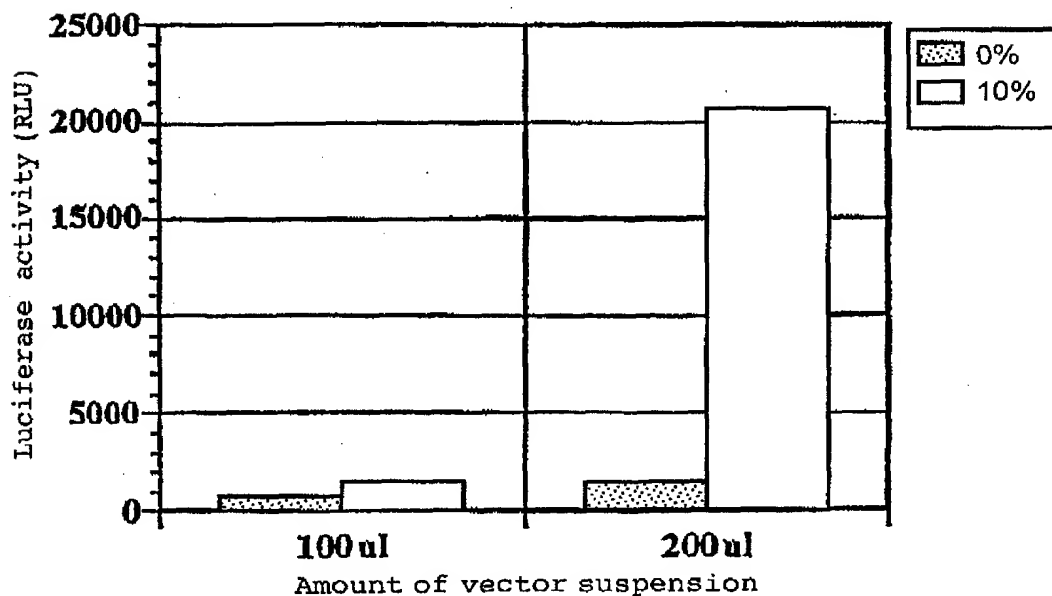


Fig. 19

Title: VIRUS ENVELOPE VECTOR FOR GENE
TRANSFER
Inventors: Yasufumi Kaneda
Attorney Docket No. 59150-8010
Customer No. 22918 Sheet 29 of 29

**Fig. 20****Fig. 21**